REMARKS

In the Official Action mailed 03 October 2006, the Examiner reviewed claims 1-21. The Examiner has rejected claims 1 and 3 and has allowed claims 2 and 4-21.

No claims are amended. Claims 1-21 remain pending.

The sole rejection is respectfully traversed below, and reconsideration is requested.

Rejection of Claims 1 and 3 under 35 U.S.C. §103(a)

The Examiner has rejected claims 1 and 3 under 35 U.S.C. §103(a) as being unpatentable over Gawa et al (US 6,090,330) in view of Brown et al. (US 3,698,797). Reconsideration is respectfully requested. For ease of reference, claims 1 and 3 are reproduced as follows:

1. A system for applying a laser beam to work pieces, comprising:

a laser system producing an output beam;

target delivery optics arranged to deliver said output beam to a target work piece;

a relay telescope having a telescope focal point in a beam path between the laser system and the target delivery optics which relays an image between an image location near an output of the laser system and an image location near said target delivery optics; and

a baffle including an opening at the telescope focal point large enough to easily pass the output beam propagating to the target, and small enough to block off angle and out of focus back reflections from the target delivery optics.

3. The system of claim 1, wherein said baffle comprises a pinhole baffle.

The Examiner reads the element "laser system" on element 21 of Gawa et al. and the element "target delivery optics" on the elements 28x and 28y of Gawa et al. The Examiner relies on Brown et al. for the purposes of teaching the "relay telescope" and the "baffle" of the claim.

As to the "relay telescope", the Examiner takes the position that lenses 21 and 15 in Brown et al. constitute a relay telescope. Applicant submits that the Examiner is mistaken. Lens 21 of Brown et al. is designed to provide a focal spot which is used to determine the beam spot size with respect to positioning of the pinhole 13. Lens 15 of Brown et al. is designed to re-collimate the light after the pinhole. See column 2, lines 2-15 of Brown et al. Brown et al. does

refer to lens 15 as a "reimaging lens" (column 2, line 9), stating that its position may be adjustable such that the beam exits in a manner other than collimated. At column 3, lines 24-27, Brown et al. suggests that the term "reimaging" is in reference to the possible desire "to reimage the focal point of the focusing lens." However, in Brown et al. there is no discussion of relay imaging as required by claim 1 "... which relays an image between an image location near an output of the laser system and an image location near said target delivery optics".

As to the "baffle" of the claim, the Examiner takes the position that the baffles 12 in Brown et al. meet the claim limitation. Applicant submits that the Examiner is mistaken. The baffles 12 in Brown et al. are positioned between the laser source and the pinhole 13. While in Figure 1 it appears that the focal point of lens 21 is positioned near one of the baffles, this positioning is not critical to the operation of Brown et al. Rather, the focal point in Brown et al. is positioned relative to the pinhole 13 to create a diverging cone of light that is partially blocked by the pinhole to achieve attenuation. The cross-section of the diverging cone at the pinhole 13 can be adjusted in size by adjusting the position of the focal point. The baffles 12 are designed to block back reflections from the pinhole 13, and not back reflections from the target. Their position relative to the focal point is arbitrary.

The input beam of Brown et al. at the pinhole 13 is larger than the pinhole and thus the amount of light transmitted to the target is dependent on the size of the pinhole relative to the size of the laser beam spot at the pinhole. In column 3, lines 6 thru 12 Brown et al. state, "An important consideration for operation of the attenuator is that the pinhole assembly be operated in the diverging cone of light beyond the focus to minimize back reflection into the source and to make it easier to collect and dissipate the high power rejected light." This "back reflection" is from their tiny pinhole 13 which is rejecting a large amount of input light otherwise headed to target. This is not "back reflection" from the target as stated in the claim. Their pinhole 13 will perform some isolation of light reflected from the target but it will not "easily pass the output beam propagating to the target" as stated in the claim. See Brown et al., Claim 1, and Column 4, line 17.

One can note that Brown et al. indicate that their system can operate at powers up to 100 W. The technology of the present invention can be applied for implementing a target isolation system which routinely operates at a peak power of 1,000,000,000 W. The pinhole in Brown's system would be ablated away after a small number of pulses, coating the lenses with debris.

Gawa et al. were concerned about light reflecting from a support structure located behind their target workpiece. They were drilling holes in the workpiece and were concerned that light could reflect from the backside support once the hole was drilled. To fix this problem their invention eliminates the backside support and instead puts the support on the sides. Once they drilled through, their beam would continue to expand until it reaches some structure below. The light reflected from this lower structure would expand and be blocked by the "pinhole" that they had just drilled. They apparently were not concerned with reflections from the target while they were processing it and thus their invention does not suppress reflections from the target. Gawa et al. have target delivery optics and focus the beam onto the target but do not relay an image of the near field output onto the target. They also do not insert a target isolation system, as claimed herein, between the laser and the target to prevent light from the target getting back to the laser.

It is important to recognize that an attenuator as taught by Brown et al. reduces light going forward to the target, whereas a target isolation system attempts to transmit all forward going light, while reducing light going in the opposite direction scattered back from a target. Brown et al. teach a laser attenuator which allows controlled reduction of laser energy reaching the target. It does not attempt to transmit nor can it transmit all of the incoming light to the target. Thus it can be understood as discussed above, that Brown et al. teaches attenuator technology and the attenuator does not include a relay telescope or a baffle as required in claim 1.

Claim 3 depends from claim 1, and is patentable for at least the same reasons as claim 1. Furthermore, no reference cited by the Examiner places a pinhole baffle at the focal point of a relay telescope as required in claim 3.

Accordingly, reconsideration of the rejection of claims 1 and 3 is respectfully requested.

Allowable Subject Matter

The Examiner has allowed claims 2 and 4-21. Such claims are not amended.

CONCLUSION

It is respectfully submitted that this application is now in condition for allowance, and such action is requested.

The Commissioner is hereby authorized to charge any fee determined to be due in connection with this communication, or credit any overpayment, to our Deposit Account No. 50-0869 (MICI 1003-2).

Respectfully submitted,

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